WHAT IS CLAIMED IS:

1. A method of dynamically adjusting the control parameters of a proportional gain and integral time controller disposed to control an actuator affecting a process, comprising:

sampling a feedback signal representative of a controlled variable of the process to generate a sampled signal;

generating a smoothed signal based on the sampled signal;

determining an estimated noise level of the sampled signal;

determining if control output and process output are oscillating quickly based on predefined criteria;

adjusting the gain used by the controller if the control output and process output are oscillating quickly; and

utilizing the adjusted control parameters to control the actuator, thereby causing the controller to affect the process.

2. The method of claim 1, wherein adjusting the gain comprises decreasing the gain.

3. The method of claim 1, further comprising determining whether a significant load disturbance occurred by comparing a tune noise band to the difference between a current setpoint value and the smoothed signal if the control output and process output are not oscillating quickly.

4. The method of claim 3, wherein the gain and integral time remain the same if a significant load disturbance has not occurred.

5. The method of claim 3, further comprising characterizing a closed loop response by monitoring features from a control signal, smoothed process output, and slope of the process output if a significant load disturbance occurred.

6. The method of claim 5, further comprising determining whether a pattern is insignificant based on a setpoint and tune band or whether the control output is saturated.

7. The method of claim 6, wherein the gain and integral time remain the same when the pattern is insignificant or the control output is saturated.

8. The method of claim 6, wherein a new gain and new integral time are determined when the pattern is not insignificant and the control output is not saturated.

9. The method of claim 8, wherein the new gain and new integral time are determined based on estimated optimal gain, estimated optimal integral time, current gain and integral time values used in the controller, a signal-to-noise ratio of the sampled signal, and size of a current load disturbance or setpoint change relative to average disturbance size.

10. An apparatus for dynamically adjusting control parameters of a proportional gain and integral time controller disposed to control an actuator affecting a process, comprising:

means for sampling a feedback signal representative of a controlled variable of the process to generate a sampled signal;

means for generating a smoothed signal based on the sampled signal;

means for determining an estimated noise level of the sampled signal;

means for determining if control output and process output are oscillating quickly based on predefined criteria;

means for adjusting the gain used by the controller if the control output and process output are oscillating quickly; and

means for utilizing the adjusted control parameters to control the actuator, thereby causing the controller to affect the process.

11. The apparatus of claim 10, wherein adjusting the gain comprises decreasing the gain.

12. The apparatus of claim 10, further comprising means for determining whether a significant load disturbance occurred by comparing a tune noise band to the difference between a current setpoint value and the smoothed signal if the control output and process output are not oscillating quickly.

13. The apparatus of claim 12, further comprising means for not changing the gain and integral time values if a significant load disturbance has not occurred.

14. The apparatus of claim 12, further comprising means for characterizing a closed loop response by monitoring features from a control signal, smoothed process output, and slope of the process output if a significant load disturbance occurred.

15. The apparatus of claim 14, further comprising means for determining whether a pattern is insignificant based on a setpoint and tune band or whether the control output is saturated.

16. The apparatus of claim 15, further comprising means for not changing the gain and integral time values when the pattern is insignificant or the control output is saturated.

17. The apparatus of claim 15, further comprising means for determining a new gain and new integral time when the pattern is not insignificant and the control output is not saturated.

18. The apparatus of claim 16, further comprising a means for determining a new gain and new integral time based on an estimated optimal gain, estimated optimal integral time, current gain and integral time values used in the controller, a signal-to-noise ratio of the sampled signal, and size of a current load disturbance or setpoint change relative to average disturbance size.

19. A method of dynamically adjusting the control parameters of a proportional gain and integral time controller disposed to control an actuator affecting a process, comprising:

sampling a feedback signal representative of a controlled variable of the process to generate a sampled signal;

generating a smoothed signal based on the sampled signal;

determining an estimated noise level of the sampled signal;

determining whether a pattern is insignificant based on a setpoint and tune band and whether the control output is saturated;

determining a new gain and a new integral time and setting the gain and integral time of the controller to the new gain and new integral time if the pattern is not insignificant and the control output is not saturated; and

utilizing the adjusted control parameters to control the actuator, thereby causing the controller to affect the process.

20. The method of claim 19, wherein the new gain and new integral time are determined based on an estimated optimal gain, estimated optimal integral time, current gain and integral time values used in the controller, a signal-to-noise ratio of the sampled signal, and size of a current load disturbance or setpoint change relative to average disturbance size

21. The method of claim 19, further comprising determining whether control output and process output are oscillating quickly based on predefined criteria.

22. The method of claim 21, further comprising adjusting the gain used by the controller if the control output and process output are oscillating quickly, wherein adjusting the gain comprises decreasing the gain.

23. The method of claim 21, further comprising determining whether a significant load disturbance has occurred by comparing a tune noise band to the difference between a current setpoint value and the smoothed signal if the control output and process output are not oscillating quickly.

24. The method of claim 23, wherein the gain and integral time remain the same if a significant load disturbance has not occurred.

25. The method of claim 24, further comprising characterizing a closed loop response by monitoring features from a control signal, smoothed process output, and slope of the process output if a significant load disturbance has occurred.

26. The method of claim 19, wherein the gain and integral time remain the same when the pattern is insignificant or the control output is saturated.